PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	16 -02- 2005
Applicant's or agent's file reference LM 11961 WO	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/SE 2004/001603	03.11.2004	04.11.2003

International Patent Classification (IPC) or both national classification and IPC
C23C 14/56, C23C 14/30 C23C 14/16, C23C 30/00

Applicant
SANDVIK AB (publ) et al

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [x] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further opinions, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language, _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	3-11	YES
	Claims	1,2,12	NO
Inventive step (IS)	Claims		YES
	Claims	1-12	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations:

Reference is made to the following documents:

D1) US-4 763 601-A
D2) EP-570 618-A1
D3) US-5 429 843-A
D4) Patent abstracts of Japan, abstract of JP-2 122 064, publ. 1990-07-18

The present invention relates to a strip of stainless steel that is coated with gold, copper etc. (cf. claim 1). It also relates to a method for producing the strip. One aim of the invention is to achieve a strip with thin, uniform and continuous coatings with excellent adhesion to the strip and also good electrical conductivity. Furthermore, the method for producing the strip shall be cost-efficient.

D1 (col.1, lines 56-64, col.3, lines 18-28, col.5, lines 55-57, col.7, line 46-col.8, line 16, col.8, line 67-col.10, line 11 and fig.6) describes an apparatus for coating a strip of stainless steel according to a continuous (roll-to-roll) process with a coating of, for example, copper, nickel or molybdenum. One suitable process is evaporation using an electron beam (EB). The process can be preceded by bombardment with ions of argon. The intention of the bombardment treatment is to achieve high affinity between the steel strip surface and the coating layer. Bending the strip over 180° at a radius of curvature that is 2.5 times

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box V

as large as the thickness of the strip causes no separation of the coating from the strip. Strips can be produced in a comparatively short time. The thickness of the layer is e.g. 1000 Å, and the thickness of the strip is e.g. 0.3 mm. Steels mentioned in D1 are SUS 304, SUS 316 and SUS 430, i.e. steels with a chromium content higher than 10 %.

D2 (col.1, line 5-col.9, line 44, col.14, line 29-col. 15, line 12 and fig.1) reveals a process for continuously coating a strip of stainless steel with a film (roll-to roll). The problem of weak adhesion between the surface of the strip and the film is solved by this method. Moreover, the film is easily obtained at low cost and with good productivity. Before electron beam evaporation (EB) of a film material, the surface of the steel strip is activated with ions of argon. In order to regulate the film thickness to a predetermined value, a film thickness monitor (6) and a control component (51) are used. The film thickness is e.g. 3000 Å. It is not mentioned in D2 that the chromium content is at least 10%. However, it is considered to be well known to a person skilled in the art that stainless steels in most cases have chromium contents of > 10%.

Even if it is not explicitly mentioned in D1 or D2 that a bombardment of the strip with ions of argon has an etching effect, it is well known to a person skilled in the art that such an effect is possible to achieve, refer to, for example, D3 (col.3, lines 29-31).

Claims 1,12

The features in the characterising part of claim 12 describe process steps according to prior art, refer to, for example, D1 or D2 (in view of D3). Hence, using the same process steps as in D1 or D2, the coated stainless steel strip product in claim 1 should have the same features as the coated stainless steel strips in D1 or D2. Therefore, the invention in claims 1 and 12 appears to lack novelty.

Concerning observations on clarity in the claims, see Box VIII.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of: Box V

Claim 2

The steel strip in D1 can have a thickness of e.g. 0.3 mm, i.e. a thickness within the intervals stated in claim 2. With the same argumentation as in the previous paragraph, the product in claim 2 appears to lack novelty.

Claim 3

Applying the process according to D1 to ordinary kinds of stainless steels with a specific minimum tensile strength is considered obvious for a person skilled in the art. Therefore, the product in claim 3 is not considered to involve an inventive step.

Claims 4-9

Arranging several layers, each of which has a specific thickness, as well as layers of different metals onto the steel strip is considered obvious for a person skilled in the art. Refer to, for example, D4 (abstract), which mentions layers of Al, Ti, Si, Nb, Cr, Mo, Cu and Ni. Hence, the subject matter of claims 4-9 is considered to lack an inventive step.

Claims 10-11

The subject matter of the product in claims 10 and 11 does not characterise the product but merely a suitable application for its use (see further Box VIII). However, the present use of the product is considered obvious for a person skilled in the art. Therefore, this subject matter does not involve an inventive step.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawing or on the question whether the claim are fully supported by the description, are made:

According to PCT Article 6, the claim or claims shall define the matter for which protection is sought. Claims shall be clear and concise. They shall be fully supported by the description:

Claims 1-11

The coated steel strip product of claims 1-11 is defined in terms of adhesion, thickness tolerance and preferred thickness for layers of gold, copper etc. Consequently, the claims are defined in terms of a result to be achieved. The claims, therefore, lack clarity.

An invention can be defined in terms of a result to be achieved if it can only be defined in this way and if the result can be achieved without undue experimentation (PCT Guidelines 5.35). It has not been clarified that this is the case.

Claims 1-11 are, consequently, not clear and concise as is called for in PCT Article 6.

Claim 12

The technical features in claim 12 relate to a method for manufacturing the steel strip product according to claim 1. However, claim 12 states only that the product is produced in a continuous roll-to-roll process, which is included in a strip production line using electron beam evaporation and an etch chamber in-line. No technical features involving more specific process steps and process parameters that would lead to the specific product in claim 1 are mentioned in claim 12. In other words, the method does not state how to arrive at the product in claims 1-11. The scope of the claim appears to comprise a lot of possible ways of arriving at the result stated in claims 1-11. Hence, claim 12 is not clear and concise as is required in PCT Article 6.

Claims 10-11

The subject matter of the product in claims 10 and 11 does not characterise the product but merely a suitable application for its use. Therefore, the product in claims 10-11 lacks clarity (PCT Guidelines 5.37).